Space Weather Forecast

Issued on Tuesday, 13 February 2024 at 13:30 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: CME arrivals possible 13 and 14 Feb, with Minor Storm intervals likely and a chance of Moderate Storms. Moderate flares expected, with a chance of Strong flares. Minor radiation storming likely to slowly decline.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Activity was Moderate with the peak flare from a region just hidden beyond the northwest limb. There are seven sunspot regions on the visible disc, with the most complex region in the southwest simplifying slightly. A further complex region in the northeast is also simplifying, but both this and the larger region present a significant risk of flaring. A further region in the northwest is moderately complex but relatively inactive. The remaining visible regions are all unipolar and stable, but a region just beyond the northeast limb has exhibited CME and flare activity, and has the potential to be a significant region as it rotates onto the visible side of the Sun.

A CME which left the Sun on 08 Feb appears to have arrived early on 13 Feb. Two further fast CMEs have been observed and analysed in the last 24 hours, one from the northwest and one from the northeast limb, but neither are forecast to have an Earth directed component.

Solar Wind / Geomagnetic Activity: Solar winds declined from elevated to slightly elevated levels, with a brief increase due to the arrival of a further CME halfway through the period. Total Magnetic Field was weak, but with a notable step change due to the CME arrival. The north-south component varied weakly positive initially, but then became weakly negative due to the CME arrival. Geomagnetic activity was Quiet.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has been above the Minor Radiation Storm level throughout and briefly increased above the Moderate Radiation Storm level later in the period, but has since followed a declining trend.

Four-Day Space Weather Forecast Summary
Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.

Space Weather Forecast

Solar Activity: Moderate activity is expected with further M-flares, and a chance of X-flares. These most likely from AR3576 in the southwest, or perhaps from the new region rotating onto the northeast limb.

Solar Wind / Geomagnetic Activity: There are two CMEs which may have Earth-directed impacts, one of which is a potential glancing blow during 13 Feb, with a second more likely arrival late 13 Feb or into 14 Feb, but low confidence in the extent of any impacts. This has the potential to combine with the previous impacts, leading to a risk of enhanced response. Solar winds are then expected to gradually ease 15 Feb onward.

Initially Quiet geomagnetic activity is likely. During 13 Feb and into 14 Feb with the potential CME arrivals, G1/Minor Storm intervals become likely with a chance of G2/Moderate Storms. Any combined impacts bring a slight chance of G3/Strong Storms. CME influence will then ease later 14 Feb and into 15 Feb, with activity becoming mainly Quiet by 16 Feb.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is currently at the Minor Radiation Storm threshold on a declining trend. Further enhancements are possible associated with potential CME arrivals on 13 or 14 Feb, along with any significant flares from the large region in the southwest quadrant. In the absence of further enhancements, proton flux is most likely to continue on a declining trend, likely falling back below the Minor Radiation Storm threshold by 15 Feb.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.

Met Office

Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	70	40	5	1
Strong	G3	No	15	10	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	70	70	70
Very Active	R3 to R5 X	No	20	15	15	15

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	100	70	40	20
Very Active	≥ S3 *	No	10	10	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.